The Potential of Air-Sparged Hydrocyclone Flotation in Environmental Technology

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ABSTRACT

Air-sparged hydrocyclone (ASH) flotation is a high capacity flotation technology originally developed in the Department of Metallurgical Engineering at the University of Utah for processing mineral resources. However, the technology has been found to be useful in industrial waste processing, recycling for the recovery of secondary resources, and in remediation of environmental disasters. For example, areas in which the ASH technology has demonstrated potential include: cleaning of waste coal fuels, air stripping to remove volatile organics from drinking and process water, water disinfection by ozone or chlorine sparging, dispersed oil removal from water, and contaminated soil remediation. Recently, the ASH has been studied extensively for de-inking flotation in the waste paper recycling industry and has been shown to have excellent efficiency/capacity. In fact, a 20 million-dollar plant is under construction in the U.S. and is scheduled for start-up this summer. The ASH technology can provide a specific capacity hundreds to thousands of times higher than that which can be achieved in conventional equipment, and is expected to be far superior to other standard technologies. The design and the principles of flotation in the air-sparged hydrocyclone are described. Experimental data with the 2-inch and 6-inch ASH systems for fine coal flotation, volatile organics stripping, and de-inking flotation for paper recycle are presented and discussed.